followed by conventionally drying and heating the coated web to form the mats of the present invention, and also laminates containing such a mat.

The mats of the present invention are novel and unique because never before have wet mats been coated with a froth or foam in the initial mat forming process and on the mat forming line prior to drying the mat and curing the binder. Prior art coated mats were coated off-line on a separate coating process line requiring extra handling, a second drying and/or heating step resulting in a substantially higher cost mat than the mats of the present invention due to the additional handling, higher capital costs of the additional equipment and space required by the coating process line causing higher overhead costs, and higher energy costs for the second heating step. The resultant coated mat is also novel because the resin(s) in the foam coating and in the mat binder cure together and the mats of the present invention have a higher permeability that other foam coated mats.

Claims 16-18, 20-22, 41, 42 and 45-47 were rejected under 35 USC 103(a) as being unpatentable over Gill et al in view of Potter et al. The Examiner alleges that Gill et al teaches a composite material comprising a fibrous nonwoven mat having an air permeability of 220 CFM/sq.ft. and a coating of foam onto the top surface of the mat, but that Gill et al doesn't teach the blow ratio or viscosity of the foam. The Examiner cites Potter et al as teaching applying a foam having a blow ratio within the limitation claimed by applicant to the backside of a pile carpet and urges that it would have been obvious for one of ordinary skill in the art to use a foam of the type taught by Potter et al on the mat taught by Gill et al. This rejection is traversed because applicants believe that Gill et al neither teaches or reasonably suggests a mat like that presently claimed and because one skilled in the art would not have looked to Potter et al for guidance in what type of foam to use with the mat taught by Gill et al.

Gill et al teaches a nonwoven fiber glass mat for facing use as a facer in the manufacture of foam insulation boards in which a polyisocyanurate foam is laid onto the mat in a separate off-line operation after the resin binder holding the glass fibers together in the mat has been dried and cured, see col. 2, lines 65-68 and col. 3, lines 1-5. One skilled in the art recognizes that the binder taught here by Gill et al is a thermosetting binder. Thus when the foam is applied to the mat taught by Gill et al the fibers in the mat are dry and coated and bound together by a cured, thermoset binder and thus are not in a unbonded, wet web condition as in the presently claimed invention. For these reasons, one skilled in the art looking for additional information on the polyisocyanurate and polyurethane foams mentioned by Gill et al would look to patents, etc. dealing with these type of rigid foams and

would not look to Potter et al which does not teach these kind of foams – note that the foam of Potter et al must pass completely through the woven backing and pile of the carpet (col. 2, lines 34-38 and col. 3, lines 11-12. Further, one looking for further information on the foams mentioned by Gill et al would not look to Potter et al because the foam of Potter must penetrate the mat to coat the pile which is contrary to the objective in the present invention. The supplier and trade name of the foam used by Potter is different than the foams used and disclosed by applicants. Potter et al does not provide the total composition, particularly the total composition of the foam, or of a single foam suitable for use in their disclosed process. There is not reason to believe that the foam used by Potter et al is the same type used in the present invention and thus one skilled in the art would have no reason to look to Potter et al. Further, one practicing Potter et al would not look to Gill et al for a mat for use in Potter et al because the object of the Gill et al mat is adverse to the essential feature of the foam passing through the mat. It is not proper for the Examiner to use Applicants' own disclosure as a roadmap to piece bits and pieces of non-related patents together with hindsight reconstruction to reject the claims under 35 USC 103, see American Medical Systems, Inc. v. Medical Engineering Corp., 26 USPQ 2d 1081, 1091, 1992, or as an instruction manual or template to piece together teachings of prior art to render the claims obvious, see In re Fritch, 23 USPQ 2d 1780, 1783, 1992. Economy of production is as valid a basis for invention as foresight in disclosure of new means and an answer to a long felt want is a valid signpost of invention, see Kaynar Company et al v. The I. Leon Co., Inc., 128 USPQ 25, 27-28, 1960.

It is not right to say that the mat of Gill et al should perform in a similar and acceptable manner with the foams that are used in Potter et al. One skilled in the art would quickly recognize that the type of foams mentioned by Gill et al would not be suitable for use in Potter et al because those foams cure to a rigid structure, like a board. One skilled in the art would also suspect that the mat of Gill et al might prevent or at least hinder "strike through" (see col. 1, lines 30-33 of Gill et al) that would frustrate or hinder the Potter et al process - they teache that the foam must pass through the mat and wet the pile. For these reasons it would not be obvious, in the sense of 35 USC 103, to use the foam disclosed by Potter with the mat of Gill to make either the vinyl flooring or insulation board products disclosed by Gill et al, not the type of mat described by the present claims. The vinyl floor covering product mentioned by Gill et al is mentioned in several floor covering patents, such as No. 14 in the IDS filed in this application, U. S. Pat. No. 5,578,363 (see col 3, lines 32-50 and col. 4, lines 18-25) in which a dry nonwoven fibrous mat comprising glass fibers bonded

together with a cured acrylic binder is coated with a layer of foamable plastisol as a first step in a process of making a floor covering product.

The Examiner urges that the presently claimed coated mat laminate does not differ from the mat of Gill et al when a foam is later applied except possibly in the properties of the foam used. This position is not right. In the manufacture of the presently claimed foam, the foam contacts glass fibers that are wet with a slurry water (called whitewater) and, when a separate aqueous binder is used, with the aqueous binder composition. The foam blends with the slurry water and aqueous binder composition on at least the fibers at and near one surface and this blend is then dried and cured to coat the fibers and bond them together. This makes the product different in an unobvious way than any other foam coated laminate or mat and also just the kind of difference that is best described as a product by process of making. Also, by adding the foam on-line without having to add an additional drying step or having to run the mat through an off-line coating process, the mat of the present invention is substantially less costly to manufacture than prior art foam coated mats and laminates. The fact that the industry has been incurring this substantially higher cost for many years is further excellent evidence of the unobviousness of the presently claimed invention.

Further, the product of the claimed invention is substantially different than the mat of Gill et al and of the vinyl flooring sheets and foam insulation boards that were the intended products of the mat of Gill et al. The attached Declaration of a co-inventor includes a mat made according to the present invention, Exhibit 1, a commercially available mat called AGF MAT made by the Assignee of the Gill et al patent and the Assignee of the present application, and made according to the disclosure of Gill et al, Exhibit 2, a sample of a commercial insulation board in which a layer of foam of the type disclosed by Gill et al is faced on opposing surfaces with the AGF mat of Exhibit 2, Exhibit 3, and a vinyl flooring sheet in which an AGF mat is coated with a polymer layer used in the flooring industry to make vinyl flooring products, Exhibit 4.

The yellow surface of Exhibit 1 is the up side as made and the surface on which the foam disclosed in the present disclosure was applied. Very little, if any, of the foam migrated to the opposite side as evidenced by the vast difference in color. It is readily apparent that the mat of Exhibit 1, the presently claimed invention, is substantially different than Exhibits 2, 3 and 4. The difference with Example 2, the AGF mat of Gill et al, can be seen most clearly when both mats are held up to the light side by side. The Exhibit 1 mat is more open, is much stiffer, and differs between top surface and bottom surface much more

than the AGF mat of Exhibit 2. The vast differences between the mat of the present invention, Exhibit 1, and the products of Exhibits 2 and 3, the products disclosed by Gill et al as the products to be made with the AGF mat, Exhibit 2, are readily apparent. For these reasons, the Gill et al mat and products made with the Gill et al mat do not anticipate or render obvious the mat of the present invention. Exhibits 1-4 are relied on here to show that the mat of the present invention is substantially different that the mat of Gill et al and the products disclosed by Gill et al using the Gill et al mat.

For these reasons applicant believes that the presently claimed invention is properly claimed as a product by process of making and that the presently claimed invention is not obvious in the sense of 35 USC 103 because of the teachings of Gill et al and Potter et al. Applicant respectfully requests that the Examiner withdraw this rejection and allow all of the claims.

Claims 23-26 and 48-51 were rejected under 35 USC 103(a) as being unpatentable over Gill et al in view of Potter et al for the reasons stated above and further in view of Randall et al. Randall teaches making a gypsum wall board comprising a commercial fibrous nonwoven mat like the present assignee's DURA-GLASS™ dry mat that has later been coated off-line and with a resinous binder, see col. 5, lines 54-65. The coated mat taught by Randall is made differently than the presently claimed mat, and is substantially different than the presently claimed mat, see col. 6, lines 46-50 of Randall. The teachings of Gill et al and Potter do not teach or reasonably suggest, in the sense of 35 USC 103, the presently claimed mat and the teachings of Randall, aside from showing that it is known to use a fibrous, nonwoven mat to face a gypsum wall board in the latter's manufacture, do not reasonably suggest the presently claimed laminate. The Examiner is respectfully requested to withdraw this rejection and to allow claims 23-26 and 48-51.

Claims 16-22 and 41-47 are rejected under 35 USC 103 as being unpatentable over Randall in view of Potter et al. The Examiner states that Randall teaches a laminate material comprising a fibrous nonwoven mat having an air permeability of 700 CFM/sq.ft. and a coating of an expanded polystyrene foam material onto the top surface of the mat and that it would have been obvious, in the sense of 35 USC 103, to have used the foam taught by Potter et al instead of the expanded polystyrene used by Randall so that the foam would penetrate through the mat to achieve an optimum condition. This rejection is traversed because it is based on a misunderstanding of Randall and because one practicing Randall

would not look to Potter et al to determine what other foam to adhere to a fiber glass mat faced gypsum wall board.

The specimens of expanded polystyrene foam mentioned in line 47 of col. 10 of Randall are insulation pieces like foam insulation board, and not a foam precursor or an uncured foam. Note that the specimens of --- foam are adhered to the mat with a water-based acrylic adhesive – not by causing the foam specimens to penetrate the pores of the mat. These specimens of expanded polystyrene foam are being adhered to the treated mat using a water based acrylic adhesive to show that the mat treatment taught in Randall overcomes a problem discussed in col. 2, lines 51-57. For these reasons, the fact that there is no other plausible reason why one of ordinary skill in the art practicing Randall would look to Potter et al, and because the product of Randall having the expanded polystyrene foam adhesively adhered to the glass mat faced gypsum wall board is substantially different than the presently claimed invention as can be readily determined by looking at the enclosed Exhibits 1 and 2 (visualizing an expanded polystyrene layer of at least equal thickness instead of the polyisocyanurate foam layer in Exhibit 2. Applicant believes that the presently claimed invention is patentable over Randall and Potter et al. The Examiner is respectfully requested to withdraw this rejection and to allow all of the claims.

Claims 16-22 and 41-47 stand rejected under 35 USC 103 as being unpatentable over Jaffee in view of Potter et al. The Examiner states that Jaffee teaches a foam coated mat and uses the same type of binder and foam material to form a laminate as in the present invention. This rejection and its basis are respectfully traversed. Jaffee does not teach coating a nonwoven mat with foam. Instead, Jaffee teaches a method of making a novel dry mat for adhering to a dry, preformed foam, see col. 2, line 60 through col. 3, line 32 and col. 4, line 56 through col. 5, line 15. This dry mat is then later adhered to a layer of urethane foam having a density of 2.1 lbs./cu. ft. purchased from Foamex, the mat being adhered to the foam layer using an aliphatic waterborne urethane polymer adhesive, see col. 5, lines 36-46, or other adhesive. The foam discussed and used by Jaffee is a dry product that can be handled, packaged and shipped, not a wet froth or foam. This laminate or sandwich of the dry foam, adhesive and the novel B-staged mat taught by Jaffee is then hot molded at about 320 deg. F. to deform the laminate and to set the adhesive. Jaffee does not teach coating a wet, fibrous web with a wet foam to make a coated mat. Furthermore, there would be no plausible reason for one of ordinary skill in the art to look to Potter et al for other types of foam to use because Potter et al does not teach dry layers of foam that would be suitable for use the application disclosed by Jaffee, i. e. headliners and

other foam containing auto parts, see col. 1, lines 16-29. Finally, it will be obvious to one of ordinary skill in the pertinent art that the sandwich of a dry foam layer, a polymer adhesive layer and the Jaffee mat disclosed in the Jaffee patent is vastly different in appearance, composition, properties and thickness than the mat of the presently claimed invention and as represented as typical by Exhibit 1. For the above reasons Applicants believe that the presently claimed invention is patentable over the disclosures of Jaffee and Potter et al and respectfully requests the Examiner to withdraw this rejection and to allow all of the claims.

MARKED UP VERSION OF THE AMENDED CLAIMS

16. (Amended) [In] A permeable, foam coated, fibrous, nonwoven mat made by [the] a process in which an aqueous slurry containing fibers is continuously deposited onto the top surface of a moving permeable forming belt on a wet process mat machine, partially dewatered, followed by drying the wet web to produce a dry non-woven fibrous mat, the improvement comprising applying a foam or froth onto the wet web after said web has been partially dewatered and before drying, the foam or froth having a blow ratio of at least about 12, the foam forming less than 5 millimeters of liquid in the bottom of an Imhoff cone after 16 hours from the time of filling the cone to a one liter mark and the foam having a viscosity of at least about 200 centipoise, the foam or froth being of a type that breaks down fairly quickly such that the coated web has enough permeability to permit drying air to penetrate the coated web and applying said foam at a rate to produce a dry mat having a coating on one face and having a permeability of at least about 338 CFM/sq. ft.

17. (Amended) A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim [2] 16 wherein an aqueous binder is first applied to the wet, partially dewatered web and the wet, bindered web is passed over a suction box to reduce the binder content to a desired level prior to applying the foam or froth onto the top surface of the wet web.

18.(Amended) A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim [3] 17 wherein at least the majority are glass fibers and said foam is applied at a rate to produce a dry mat having a permeability of at least about 350 CFM/sq.ft.

19. (Amended) A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim [5] 16 wherein said foam is applied at a rate to produce a dry mat having a permeability of at least about 500 CFM/sq.ft.

20. (Amended) A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim [6] 16 wherein said foam has a blow ratio between about 15 and about 30.

21. (Amended) A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim [10] 16 wherein the amount of liquid formed in the bottom of the Imhoff cone is less than about 2 millimeters.

22. (Amended) A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim [15] 18 wherein the amount of liquid formed in the bottom of the Imhoff cone is less than about 2 millimeters.

23. (Amended) A laminate comprising a first material layer bonded to a second layer of a nonwoven fibrous mat, the mat having an exposed foam coating and made by the process described in claim 16.

24. (Amended) A laminate comprising a first material layer bonded to a second layer of a nonwoven fibrous mat, the mat having an exposed foam coating and made by the process described in claim 17.

41. (Amended) A permeable, foam coated, fibrous, nonwoven mat made by the process [described in claim 27] comprising making a permeable fibrous mat on a wet process mat machine in which an aqueous slurry containing fibers is continuously deposited onto the top surface of a moving permeable forming belt, partially dewatered, followed by applying an excess of an aqueous binder, removing excess aqueous binder to form a wet, bindered web and drying the wet, bindered web to produce a dry non-woven fibrous mat, the improvement comprising applying a foam or froth onto the wet, bindered web after said web, the foam or froth having a blow ratio of at least about 12, the foam forming less than 5 millimeters of liquid in the bottom of an Imhoff cone after 16 hours from filling and a viscosity of at least about 200 centipoise, the foam or froth being of a type that breaks down fairly quickly such that the coated web has enough permeability to permit drying air to penetrate the coated web and applying said foam at a rate to produce a dry, mat having a coating on one face, the mat having a permeability of at least about 338 CFM/sq. ft.

42. (Amended) A permeable, foam coated, fibrous nonwoven mat made by the process described in claim [28] 41 and wherein at least the majority of fibers are glass fibers.

43. (Amended) A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim [29] 42 and wherein said foam is applied at a rate to produce a dry mat permeability of at least about 350 CFM/sq.ft.

44. (Amended) A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim [30] 42 and wherein said foam is applied at a rate to produce a dry mat having a permeability of at least about 500 CFM/sq.ft.

45. (Amended) A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim [31] 41 wherein the foam has a blow ratio of at least about 25.

46. (Amended) A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim [40] 42 wherein the amount of liquid formed in the bottom of an Imhoff cone filled with foam and allowed to age is less than about 2 millimeters.

47. (Amended) A permeable, foam coated, fibrous, nonwoven mat made by the process described in claim [32] 42 wherein the foam has a blow ratio of at least about 25.

48. (Amended) A laminate comprising a first layer of material bonded to a second layer of a nonwoven fibrous mat, the hat having an exposed foam coating and made by the process [described in claim 27] comprising making a permeable fibrous mat on a wet process mat machine in which an aqueous slurry containing fibers is continuously deposited onto the top surface of a moving permeable forming belt, partially dewatered, followed by applying an excess of aqueous binder, removing excess aqueous binder to form a wet, bindered web and drying the wet, bindered web to produce a dry non-woven fibrous mat, the improvement comprising applying a foam or froth onto the wet, bindered web after said web, the foam or froth having a blow ratio of at least about 12, the foam forming less than 5 millimeters of liquid in the bottom of an Imhoff cone after 16 hours from filling and a viscosity of at least about 200 centipoise, the foam or froth being of a type that breaks down fairly quickly such that the coated web has enough permeability to permit drying air to penetrate the coated web and applying said foam at a rate to produce a dry, mat having a coating on one face, the mat having a permeability of at least about 338 CFM/sq. ft.

49. (Amended) A laminate comprising a first layer of material bonded to a second layer of a nonwoven fibrous mat, the mat having an exposed foam coating and made by the process described in claim [28] 48 and wherein at least the majority of fibers are glass fibers and said foam is applied at a rate to produce a dry mat having a permeability of at least about 350 CFM/sq.ft.

Applicants have filed a supplemental IDS containing numerous references. Applicants' attorney believes that none of these newly cited references, either alone or in any reasonable combination, teach or suggest the presently claimed invention. Regarding U. S. Pat. No. 6,365,533 and U.S. Published Pat. App. No. 10030032351, note that the foam coated mats taught have a very low permeability as disclosed in col. 4, lines 16-18 and 35-39 and col. 5, lines 50-55. Also, the foam coated mats of these references were made by coating conventional dry fibrous mats bound together with a cured binder and thus there could not have been simultaneously curing of both the resin(s) in the foam and the resin(s) in the mat binder. Note that the foams taught by these references for coating the mat have a much lower air content and a much higher density than the froth or foams used the make the mats of the present invention. The highest blow ratio taught by these references, at 80 percent air, is about 5 whereas the foams used in the present invention have a blow ration of at least about 12. This is the reason for the higher perm of the mats of the present invention and there is no suggestion for this in these references.

Applicants' attorney believes that the present claims are allowable, but if the Examiner believes that further amendment is required, the Examiner is invited to call applicants' attorney at the number below for the purpose of resolving the issue and expediting the disposal of this application.

Respectfully submitted,

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